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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,763	10/23/2003	Scott J. Clifford	16129	6713

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EXAMINER	
KOCH, GEORGE R	

ART UNIT	PAPER NUMBER
1734	

DATE MAILED: 07/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/691,763	CLIFFORD ET AL.	
	Examiner	Art Unit	
	George R. Koch III	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-30 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-30 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4/22/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Pearce (US patent 4,781,517).

Pearce discloses a modular apparatus for performing a process on an object conveyed to and from a location comprising a pair of frame rails (the element which items 525 are attached to, visible in Figs. 16, 17 and 18, are frame rails) extending on opposite sides of a location and general parallel to a path of conveyance of an object through the location, at least two legs (visible in Figure 18) attached to each of the frame rails for elevating the frame rails above a plane of an upper surface of the object at the location, at least one cross support member (visible in Figures 17 and 18) connecting the frame members together to form a rigid frame structure with the legs, at least one robot arm (items 525) mounted on an associated one of the frame rail, the robot arm being movable along the associated frame rail (see column 6, lines 59-65),

and a tool mounted on the at least one robot arms for performing a process on the object whereby the at least one robot arms move the tools relative to the object enabling the tools to perform processes on the object.

As to claim 3, Pearce discloses that the robot arms are positioned in opposition to provide symmetric processing to the object (see especially Figures 17 and 18).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-3, 7-9, 10, 12, 14, 16, 18, 19, 21, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo (US Patent 4,721,630) in view of Yamamoto (US Patent 5,240,745) and Pearce (US Patent 4,781,517).

Takeo discloses a modular apparatus for performing a process on an object conveyed to and from a location, comprising a pair of frame rails (items 11, see Figure

1) extending on opposite sides of a location and generally parallel to a path of conveyance of an object through the location, at least one robot arm (items 5_1 and 5_2) mounted on an associated on of each of the frame rail, and a tool mounted on each of said at least one robot arms for performing a process on the object whereby the at least one robot arms move the tools relative to the object enabling the tools to perform processes on the objects.

Takeo does not discloses that there are at least two legs attached to each of the frame rails for elevating the frame rails above a plane of an upper surface of the object at the location, and at least one cross support member connecting the frame rails together to from a rigid structure with legs.

Yamamoto (especially with reference to Figure 15) discloses that it is known to elevate painting robots by placing them on cross support members (item 572) on elevated frame rails (item 518) mounted on legs (items 94a(b), 94c(d), and 38 - best seen in Figure 16). The cross support member connects the frame rails, forming a rigid structure with legs. One in the art would appreciate that elevated positioning would enable better coating of the roof of the car body, while still maintaining the capability of coating the sides of the car body. However, Yamamoto does not place the robots on the frame rails. Pearce, though, discloses a modular apparatus for performing a process on an object conveyed to and from a location comprising a pair of frame members (the element item 525 is attached to, visible in Figs. 17 and 18) extending on opposite sides of a location and general parallel to a path of conveyance of an object through the location, at least two legs (visible in Figure 18) attached to each of the

frame rails for elevating the frame rails above a plane of an upper surface of the object at the location, at least one cross support member (visible in Figures 17 and 18) connecting the frame members together to form a rigid frame structure with the legs, at least one robot arm (items 525) mounted on an associated one of the frame members, and a tool mounted on the at least one robot arms for performing a process on the object whereby the at least one robot arms move the tools relative to the object enabling the tools to perform processes on the object. Placing the robots on the frame rails in opposed configuration as in Pearce would enable symmetrical process of a car body and better processing or coating reach of the car roof as in Yamamoto. The cross support both Pearce and Yamamoto would reduce the possibly of collapse by improving structural support. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized movable robots mounted on elevated frame rails mounted on legs in order to provide better coating reach of the car roof and to have utilized a cross support in order to provide structural support.

As to claim 2, Takeo discloses that the robot arms extend to reach the tooled mounted thereon to all exteriors surface on one side of the object.

As to claim 3, Takeo discloses that the robots are positioned in opposition to provide symmetric processing to the object.

As to claim 7 and 8, Takeo discloses that each robot arm is a 6-axis robot with a wrist implement, with the non-wrist component of the arm having 3 axes, including axes for defining a generally vertical planar operating space, and the wrist component being

connected to the free end of the arm and the tool, the wrist component having 3 axes (column 6, lines 48-64).

As to claim 9, Takeo discloses 6 axes of motion, including the four claimed.

As to claim 10, Takeo, as modified by Yamamoto and Pearce and applied to claim 1 above discusses the pair of frame rails mounted on opposite sides and extending generally parallel to the path of movement of the object (Takeo and Pearce), the frame rails being elevated above a plane of an upper surface of the object (see Pearce and Yamamoto), the frame rails being connected together in a rigid frame structure (Pearce and Yamamoto), at least one robot arm mounted on an associated one of each of said frame rails (Takeo), and that the robot arm is movable along the associated frame rail (Takeo and Pearce).

Takeo further discloses that each robot arm has at least two axes of motion for movement in a generally vertical plane transverse to the path of movement of the object (see column 6, lines 48-64). Takeo also further discloses that the tool is a paint applicator (bell type atomizers 5_f) mounted on each of the at least one robot arms (items 5_1 and 5_2) and the arms move the paint applicators relative to the object while the paint applicators dispense paint to cover the upper surface and side surfaces of the object with paint.

As to claim 12, both Pearce and Takeo disclose opposed symmetric robot designs. Takeo as incorporated discloses the capability of symmetric painting.

As to claim 14, Pearce as incorporated discloses that the frame rails are mounted on floor engaging legs (see Figures 16-18).

As to claim 16, Pearce discloses that the frame rails are connected by at least one cross support member elevated above the plane of the upper surface of the object.

As to claim 18, Takeo, Yamamoto and Pearce as applied to claim 1 above disclose or make obvious a modular apparatus for painting an object conveyed along a path, comprising a pair of frame rails (disclosed by Takeo, Yamamoto and Pearce) mounted on opposite sides of a path of conveyance of an object, the frame rails being elevated above a plane of an upper surface of the objects (Yamamoto and Pearce, as incorporated and applied in claim 1 above), at least one robot mounted on an associated one of the frame rails (Takeo and Pearce) and being movable along the associated frame rail (see Takeo, Yamamoto and Pearce as applied in claim 1 above)

Furthermore, Takeo discloses that each robot arm is a 6 axis robot with a wrist implement, with the non-wrist component of the arm having 3 axes and the wrist component of the arm having 3 axes (column 6, lines 48-64), and that there is a paint applicator (bell atomizers) mounted on each of said at least one robot for painting surfaces of the object.

As to claim 19, Takeo as incorporated discloses that at least one robot has an articulated arm with a paint applicator attached to a free end thereof capable of reaching substantially all external surfaces on a facing side of the object.

As to claim 21, Pearce as incorporated (and applied in claim 1 above) makes obvious that the frame members are mounted on legs engaging a floor of a painting booth and are connected by at least one cross support member elevated above the plane of the upper surface of the objected to form a rigid frame structure (see figures 17 and 18).

As to claim 25, Takeo, Yamamoto and Pearce as applied to claim 1 above disclose or make obvious an apparatus for processing an object moving along a path, comprising at least one frame rail (Takeo, Yamamoto, and pearce) mounted to extend along a side of a path of movement of object, the at least one frame rail being elevated above a plane of the upper surface of the object (see Yamamoto and Pearce as applied to claim 1 above), at least one robot arm, and a tool mounted at a free end of the at least one robot arm for performing a process on the object.

Takeo also further discloses a mounting base (i.e., movable tables 12_1 and 12_2) attached to an movable along the frame rails which are capable of movement on the frame rails (item 11, recited as railway means, see column 6, line 44 to column 7, line 2), and that the robot arm has four axes of movement relative to the mounting base (Takeo discloses 2 more movement axes, for a total of 6).

As to claim 26, Takeo discloses a robot wherein said four axes of movement include two primary axes of operation defining a planar operating space for the tool transverse to the path of movement of the object.

6. Claims 4, 22 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce as applied to claims 1, 21 and 25 above, and further in view of Thome (US Patent 5,744,190).

The references as applied to claim 1, 21 and 25 above are silent as to the robot arms including a process controller mounted for movement therewith along the associated frame rail.

However, Thome discloses that it is known to include process controller (control systems 109a) within the robot bodies. Thome utilizes the process controllers in conjunction with sensors for robot feedback, and one in the art would appreciate that the close proximity of the control device to the sensors reduces the amount of wiring needed between the process control and the sensor. Therefore, it would have been obvious to one of ordinary skill in the art to have utilized such process controls in order to reduce wiring between the robot feedback mechanism and the process control. Furthermore, such a placement would result in the system being mounted for movement along the associated frame rail in the context of the robots used in Takeo (as modified by Yamamoto and Pearce).

7. Claims 5 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thome as applied to claims 4 and 22 above, and further in view of Cebola (US Patent 5,738,727).

As to claim 5 and 23, Takeo, Yamamoto, Pearce, and Thomes as applied to claim 4do not disclose that the cross support member is hollow for receiving cables and conduits connecting the process controllers together.

Cebola discloses that it is known to make structural elements hollow or tubular for receiving cables and conduits connecting the process controllers together. Cebola discloses that shielding these cables protects from electrostatic fields and charges (see column 7, lines 37-45). Therefore, it would have been obvious to one of ordinary skill in the art to make cross beams and support elements tubular or hollow for receiving cables and conduits in order to protect the cables and conduits from electrostatic effects and charges.

8. Claims 6 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thome as applied to claims 4 and 22 above, and further in view of Neikter (US Patent 5,296,026).

Takeo, Yamamoto, Pearce, and Thome as applied to claims 4 and 22 above do not suggest that at least one cross support member is tubular and purged with an inert gas or air for explosion protection.

Neikter discloses that it is known for the cross support (item 20) to have a gas permeable tubular element (item 22) surrounding the cross support for generating a positive pressure (see column 4, lines 12-29). Neikter also discloses that the gas presented to the room can be an inert gas such as argon (see column 5, lines 10-17). One in the art would appreciate that this would protect the robots from explosion and

prevent chemical interactions with the paint material. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized cross supports which spread inert gas in order to protect the robots from explosion and prevent chemical interactions with the paint material.

9. Claims 13 and 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to claims 10 and 18 above, and further in view of Josefsson (US Patent 5,766,355).

Takeo, Yamamoto, and Pearce as applied to claims 10 and 18 above do not suggest that the frame rails are mounted on walls of a paint booth extending generally parallel to the path of movement. However, Takeo, Yamamoto, and Pearce have been applied to show the frame rails

Josefsson discloses that it is known to have painting robots mounted inside of a paint booth. Josefsson discloses that the use of such a paint booth confines the paint to the chamber, and facilitates collection of the paint overspray (see column 2, lines 40-61). Josefsson discloses that collection of the overspray in a paint booth allows for the later reapplication of the excess paint to subsequent automobiles (see column 3, lines 29- 43), which one in the art would immediately recognize as reducing material costs. Therefore, it would have been obvious to one of oordinary skill in the art at the time of the invention to have utilized a paint booth with walls (as in Josefsson) in conjunction with the frame rail robot design (of Takeo, Yamamoto and Pearce) in order to confine the paint overspray and facilitate paint re-use, thus reducing paint material costs.

10. Claims 15, 17, 28 and 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to claims 10, 16, and 25 (in the case of both claims 28 and 29) above, and further in view of Cebola (US Patent 5,738,727).

As to claim 15, 17 and 28, Takeo, Yamamoto, and Pearce as applied to claim 10 or 16 above do not disclose that either the frame rails are tubular, or the frame rail and cross support member are tubular.

Cebola discloses that it is known to make structural elements hollow or tubular for receiving cables and conduits connecting the process controllers together. Cebola discloses that shielding these cables protects from electrostatic fields and charges (see column 7, lines 37-45). Therefore, it would have been obvious to one of ordinary skill in the art to make cross beams and support elements tubular or hollow for receiving cables and conduits in order to protect the cables and conduits from electrostatic effects and charges.

As to claim 29, Cebola as incorporated in claim 28 above discloses coupling conduits stored with the structural elements (see Figure 4, items 224 and other items).

11. Claims 11 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce as applied to claims 10 and 25 above, and further in view of Hohn et al (US Patent 4,896,274).

Takeo as applied to claim 10 or 25 does disclose a 6-axis robot with three of the axes being in a wrist mounting. Takeo, however, is silent as to the capabilities or movements of the 3-axis wrist mounting, and one would expect any conventional 3-axis wrist mounting to be used.

Hohn discloses a known 3-axis wrist mounting (item 27), for use in either adhesive application or paint spraying (column 3, line 36) in automobile industries, which is part of a larger, 6-axis robot, similar to that in Takeo. Take discloses two tilting axes (at pivot points 28 and 30), and a rotating axis (at point 32, as see column 3, line 65 to column 4, line 16 for discussion of the movements). Hohn recites that these three axes are intended to effect control over the orientation of the tool carried by the manipulator (or robot) with respect to a relocatable point of reference. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a wrist having a rotating axis and a tilting axis as in Hohn in order to effect control over the orientation of the tool carried by the manipulator (or robot) with respect to a relocatable point of reference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-800-877-8339 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George R. Koch III
Patent Examiner
Art Unit 1734

GRK
July 13th, 2004